

# RF MODEM

Let's work without wires .....



**Instruments**  
General Instrumentation Logic Labs



## Overview

Gill Instruments ER-433 Rf modem provides a high-speed data link suitable for a wide variety of applications with system security. No configuration is necessary for out-of-box RF operation. Simply feed data into one modem, then the data is sent out the other end of the wireless link. If more advanced functionality is needed, the modems support an extensive set of AT commands.

Small size, low power, high performance, RF modem is working in the license free ISM band can be easily integrated with your application. The system can be set up in minutes to enable local-area communication in industrial, commercial and office applications.

## Applications

- Automation & Industrial control
- In-plant SCADA network communications.
- Factory floor data collection
- Security System Networks
- Electronic displays
- Point-of-Sales Terminals
- Meter Readers
- Transport vehicle identification

## Features of RF-modem

- Cost effective alternative to cable Installation for remote monitoring.
- Range up to 500m is supported.
- RS-232 protocol support.
- Excellent noise immunity using frequency hopping technology.
- Retries & Acknowledgements for reliable packet delivery.
- Built-in Repeater mode for working around obstructions.
- For power-sensitive applications; RF, Serial Port and Cyclic Sleep Modes are available. Power-down currents reach below 1 mA.
- RF data rates from 2.4kbps to 153.6kbps.
- A host interface baud rate from 300 bps to 115.2Kbps is available.
- Peer-to-peer (no master/slave dependencies), point-to-point, Point-to-multipoint network topologies supported.

## PROTOCOL MODES

The ER-433 configuration can be changed through the serial interface with Hayes commands. The serial link can work with or without flow control. The over-the-air protocol modes are:

- **Transparent Mode:** It is a multipoint protocol. The radio module simply behaves like a half-duplex wired serial link. There is no flow control, and no encapsulation is needed on the serial data frames.
- **Secured Mode:** It is a point-to-point protocol. On the radio side, data frames are encapsulated With a CRC, "verified" at reception and acknowledged, with retries in case of unsuccessful transmission. This mode offers an optimal radio link quality. A flow control is also performed on the serial link to avoid buffer saturation.
- **Addressed Secured Mode:** It is a secured mode with multipoint protocol. Each module has a Client ID and belongs to a Network. Serial data frames are encapsulated with the addressed sent ID. Only modules in the same Network can communicate together.
- **Client/Server Mode:** It is an addressed secured mode where the Server manages RF Communication to avoid collision. Data are sent in unicast (one to one) or broadcast (one to all) mode. No further management is needed into the client.
- **Repeater Mode:** A module in this mode repeats all it receives on a channel to another channel, and vice versa, doubling the range of the multi-channel devices. Non usable between modules in Client/Server mode.
- **Telemetry Mode:** This protocol reads sets or copy some Inputs and Outputs between two devices or more. The I/O is available for a RF modem connected to one or several external I/O modules.

## TECHNICAL SPECIFICATION

| 433 MHz Multi channel                    |  |
|--|--|
| Frequency Band                           | 433Mhz                                 |
| Channels                                 | 32                                     |
| RF Data Rate (Kbps)                      | 2.400Kbps -153.2kbps                   |
| Modulation                               | Frequency shift keying<br>FSK,GFSK,OOK |
| Output Power                             | 10mW (10dbm)<br>maximum                |
| Sensitivity<br>(BER < 10 <sup>-3</sup> ) | -121 dBm@2.4kbps                       |
| Range (Typical)                          | Up to 500meters                        |
| Serial Interface                         | Board: RS232-TTL                       |
| Serial data rate                         | Up to 115. 2Kbps                       |
| Supply Voltage                           | 6-30Vdc                                |
| Current Consumption                      | Tx: 27mA RX: 20mA<br>Standby < 1mA     |
| Certification                            | Designed to meet FCC<br>CFR47 part 15  |
| operating Temperature                    | -40°C to +85°C                         |

## Mechanical Specification

| Antenna                                | Case material              | Case Dimension | Serial Cable        | Power connector |
|--|----------------------------|----------------|---------------------|-----------------|
| Lambda/4 antenna<br>With SMA connector | High Impact<br>ABS Plastic | 135x70x24mm    | 25 pin D type cable | Dc male Jack    |

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